

ABSTRACT OF THE DISCLOSURE

Ion particles are discharged so as to be trapped with magnetic field lines of the earth, and collided with high-altitude neutral air to generate high velocity neutral particles through charge exchange. The high velocity neutral particles are detected. Based upon the period of time between the discharge of the ion particles and the detection of the high velocity neutral particle, the distance from the high-altitude neutral air to the discharge position of the ion source and the distance to the position of the detected high velocity neutral particle may be determined. Moreover, the direction of the high-altitude neutral air may be determined based upon the direction of the high velocity neutral particles. Furthermore, based upon the direction of the detected of the high velocity neutral particles, the spatial position of the high-altitude neutral air may be determined.